

# West Nile Virus Summary for Kentucky 2003

## Introduction

The Kentucky Department for Public Health (KDPH), as the lead agency, prepared for the 2003 surveillance of the West Nile virus through a cooperative initiative with the Kentucky Department of Agriculture (KDA). The KDPH granted a contract to the University of Kentucky Livestock Disease Diagnostic Center (UKLDDC) for West Nile virus testing of wild birds, mosquito pools and horses and to the Murray State University Breathitt Veterinary Center (MSUBVC) for wild bird and horse testing. The KDPH Division of Laboratory Services (DLS) provided IgM capture Elisa testing on human specimens, while the MSUBVC and the UKLDDC conducted polymerase chain reaction (PCR) testing on birds and mosquitoes and IgM capture Elisa on horse specimens. By the close of the year, West Nile virus activity had been documented in 60.8% of Kentucky's counties in birds, horses, humans or mosquito pools.

## Human Surveillance

Information on the human West Nile virus meningitis/encephalitis case definition, including proper submission of samples, was sent electronically to hospital infection control professionals and to all health department surveillance personnel. The State Public Health web site provided fact sheets and weekly updates on the spread of the West Nile virus through Kentucky.

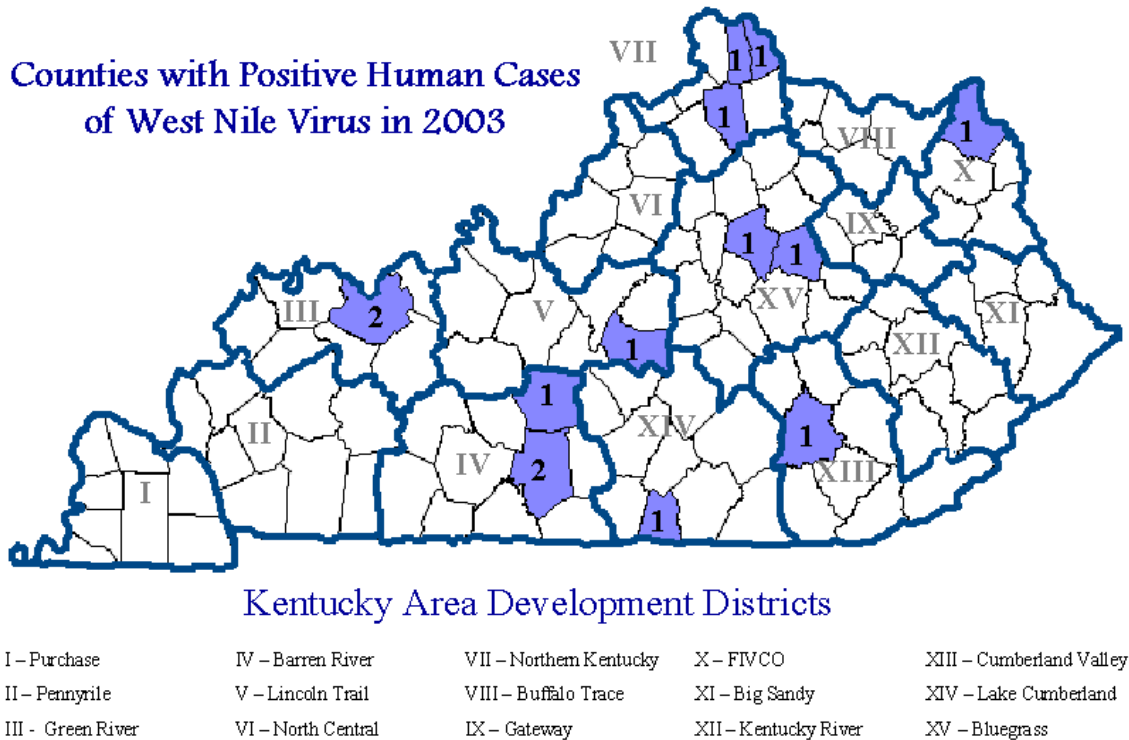
Surveillance personnel at either the local health department or the KDPH initiated a case history investigation on all West Nile virus positive specimens reported by the DLS. Positive laboratory results received from commercial laboratories were also investigated and the request was made to these laboratories to forward the samples to the DLS. Only samples testing positive at the DLS or the CDC were reported. Positive samples from commercial labs had to be confirmed at DLS or CDC. Cases were divided by clinical history into two groups, West Nile virus encephalitis/meningitis or West Nile virus fever. West Nile virus encephalitis is reportable by regulation. West Nile virus fever is a milder form of clinical disease with no neurological manifestations. It is not reportable by regulation, but the CDC's National Electronic Telecommunication Surveillance System (NETSS) did provide a code for this disease and all confirmed cases in Kentucky were transmitted to CDC along with the confirmed cases of West Nile virus encephalitis.

Fourteen patients met the clinical definition and laboratory criteria for either West Nile virus encephalitis or West Nile virus fever. Eleven persons, 78.6% of the cases were classified as West Nile virus encephalitis/meningitis. The average age for this group was 65 years, with 73% being over the age of 50 years. The youngest case was a 25 year old and the oldest an 89 year old person. Fifty-five percent of the cases were female. There was one death in this group. The week of September 14<sup>th</sup> through 20<sup>th</sup>, Morbidity and Mortality Weekly Report (MMWR) week 38, was the peak onset week. Cases were reported in 7 of the 15 Kentucky Area Development Districts (ADD).

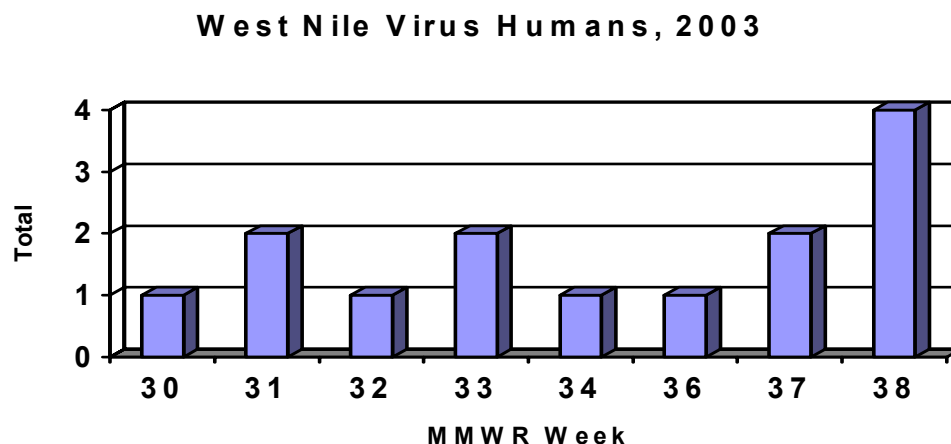
Three persons (21.4%) were diagnosed with West Nile virus fever and one of them did require hospitalization. The average age for this group was 53 years and the ages ranged from 32 to 91 years. The peak onset week was MMWR week 37. There were no deaths in this group. West Nile virus fever cases occurred in three different Kentucky ADDs.

Map 1 shows the incidence by county for all 14 cases reported in Kentucky and Chart 1 shows the onset dates by MMWR week for all 14 cases.

### Map 1



### Chart 1



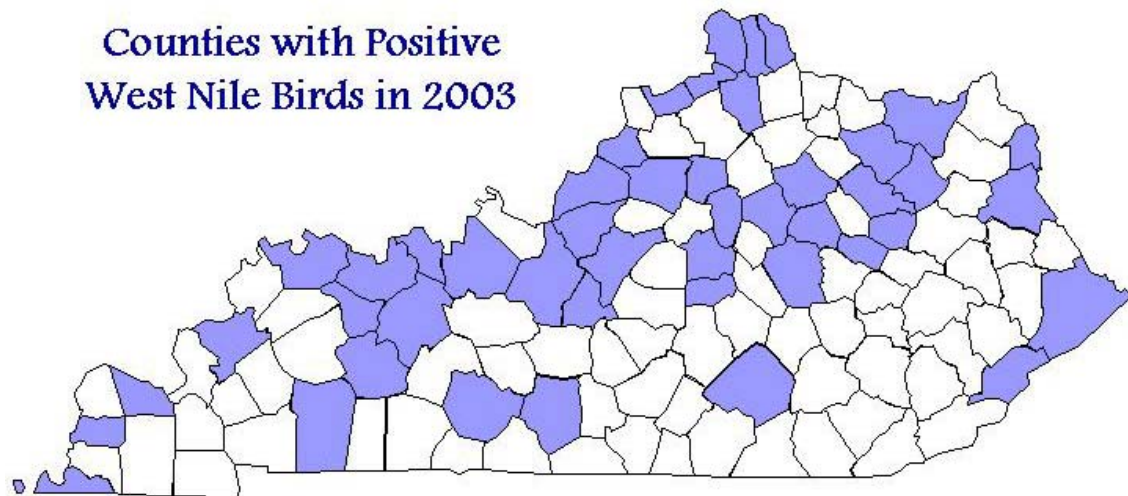
## Bird Surveillance

Each county was provided a pre-paid shipping container to submit dead birds to the UKLDDC for West Nile virus testing by the KDPH. The public was encouraged to submit birds to their local health departments' environmental section for shipment to the laboratories. The health departments in the Pennyrite and Purchase ADDs had the option of submitting their specimens to the MSUBVC in Hopkinsville for testing. Information was available on the Public Health web site about dead bird reporting and submission.

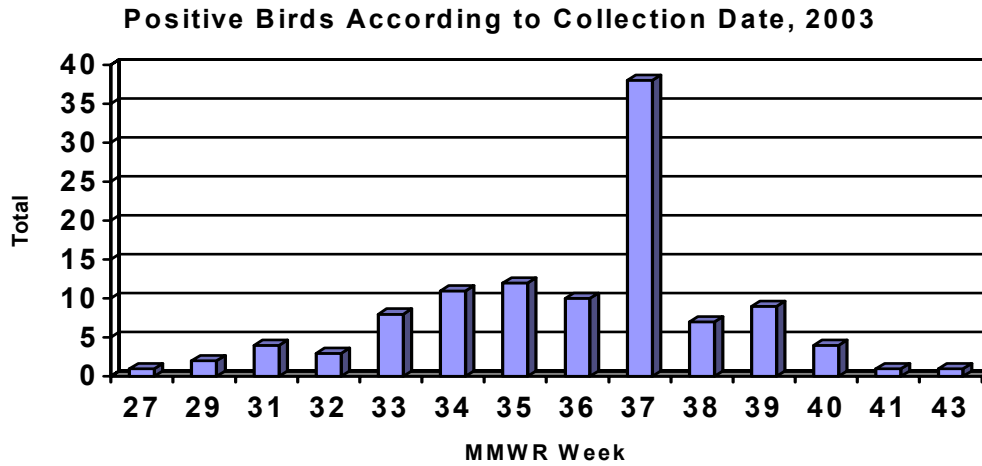
The UKLDDC accepted birds throughout the year and MSUBVC accepted them starting in June. Testing was done by PCR testing on tissues from the birds at the UKLDDC and the MSUBVC.

Five hundred seventy seven (577) birds were submitted for testing from 85 of the 120 Kentucky counties. There were 111 birds positive for West Nile virus from 46 counties (Map 2). The first positive bird was collected on June 30, 2003 from Crittenden County and the last positive bird was collected on October 25, 2003 from Oldham County. A steep increase in positive birds was noticed the second week in September, which accounted for 34% of the total positive birds for the year. Eighteen species of birds tested positive with the four most prevalent being Blue Jays (27.9%), American Robins (13.5%) and American Crows and House Sparrows (10.8%). Birds remain the most important sentinel species to provide information on the earliest activity of the virus in a given locality. MMWR week 37, September 7<sup>th</sup> through the 13<sup>th</sup>, was the peak week for positive birds, one week prior to the peak onset for humans (Chart 2).

**Map 2**



**Chart 2**



### **Mosquito Surveillance**

Fifteen counties participated in mosquito sampling for West Nile virus surveillance in 2003. The number of sites varied in each county but at each site one CDC light trap and one gravid trap was used. Trapping was done once a week and started the week of June 15 and lasted through October 13. Approximately 47,000 mosquitoes were collected in 2003 representing 32 different species. The mosquitoes were shipped to the UKLDDC where the KDPH's environmental biologist speciated the collections and separated each species into separate testing groups or pools. The mosquitoes were tested by PCR in pools of no more than 50 per species per site. Ten positive pools were collected from five counties in 2003 (Table1). The positive pools peaked the week of September 7<sup>th</sup>, MMWR week 37, one week prior to peak human onset, and all positives were urban *Culex* species.

**Table 1**

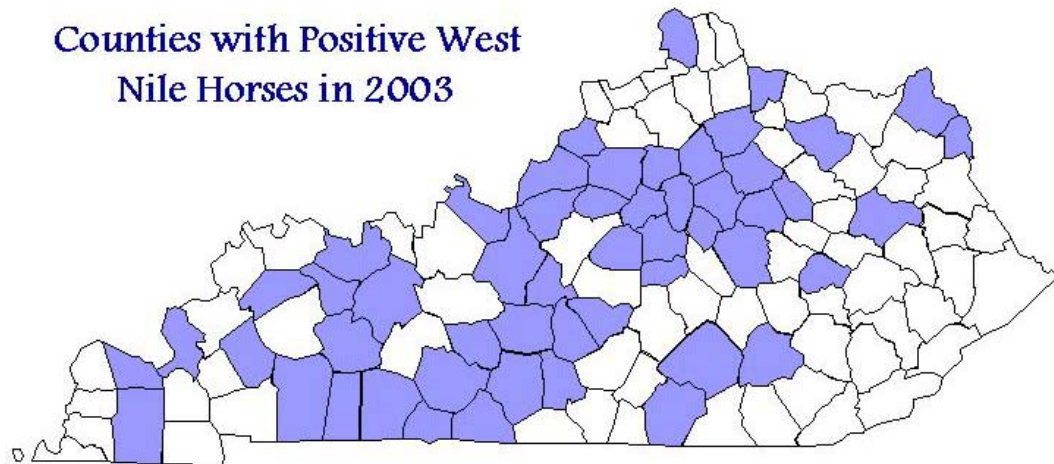
County	Number of Pos. pools	MMWR Week
Boone Co.	1	29
Daviess Co.	1	33
Fayette Co.	5	33, 34, 35, 37(2)
Fulton Co.	2	36, 37
Jefferson Co.	1	36

### **Equine Surveillance**

Kentucky Department of Agriculture personnel investigated horse cases with positive West Nile virus findings or with reported neurological disease. The KDA provided the KDPH with results on positive horses according to county of residence and

onset date. The West Nile virus surveillance group then entered this data into the Arbonet system. One hundred two (102) equines were found to be positive from 54 of the 120 counties in Kentucky (Map 3). Eighty-five percent of the positive horses were unvaccinated and only 5.9% of the West Nile virus positive horses that had received vaccine were vaccinated according to the manufacturer's recommendations. The UKLDDC and MSUBVC provided PCR results on tissue samples from necropsied horses and tested serum and cerebrospinal fluid samples with IgM capture Elisa for West Nile virus. The peak week of onset for horses was MMWR week 39, September 21<sup>st</sup> through 27<sup>th</sup>, one week after the peak onset for humans (Chart 3).

**Map 3**



**Chart 3**

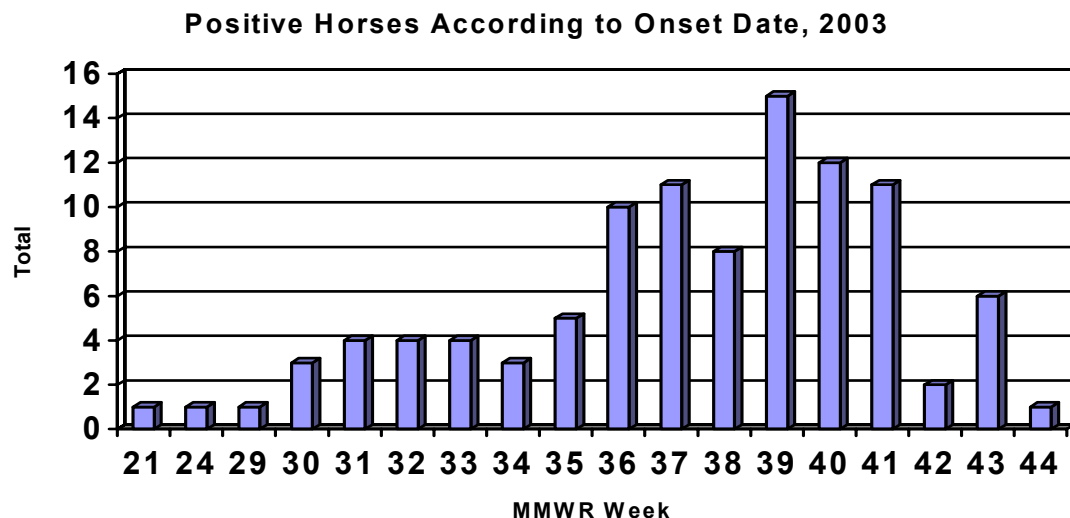
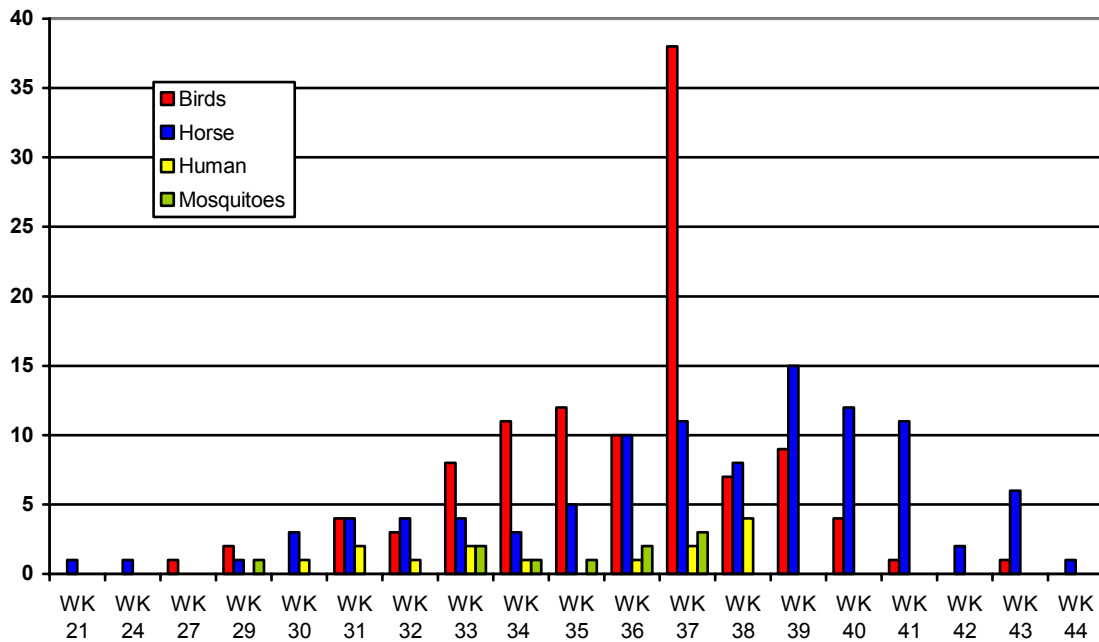


Chart 4 presents the onset date for illness in humans and horses along with the collection date for positive birds and mosquito pools by MMWR week. Positive birds and mosquito pools peaked in week 37, humans in week 38 and horses in week 39. Detecting positive birds provided the earliest evidence of viral activity.

**Chart 4**



For additional information on West Nile virus data contact either Dr. Sue Billings or Catherine Mahl in the KDPH Division of Epidemiology and Health Planning, 502-564-3418. The map of Kentucky counties with West Nile virus activity in 2003, and the County West Nile virus chart, listing the positives by species for each county, may be found on the Public Health web site in the data warehouse section and on the West Nile web page.

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